PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of Letant et al. Application No.: 10/677,395 Filed: 10/01/2003 For: FUNCTIONALIZED APERTURES FOR THE DETECTION OF CHEMICAL AND BIOLOGICAL MATERIALS	Group Art Unit: 1634 Examiner: CROW, Robert T. Attorney Docket No.: LLNLP010/IL-11138 Date: July 6, 2009

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTENTION: Board of Patent Appeals and Interferences

REPLY BRIEF (37 C.F.R. § 1.193)

This Reply Brief is being filed within two (2) months of the mailing of the Supplemental Examiner's Answer, which was mailed on May 14, 2009.

Following is an issue-by-issue reply to the Supplemental Examiner's Answer.

In section (10) "Response to Argument" of the Supplemental Examiner's Answer mailed May 14, 2009, the Examiner has included the arguments already submitted in the Examiner's Answer mailed Dec. 23, 2008, and has added a new section entitled "Response to the Reply Brief of 19 February 2009."

In response to the Examiner's arguments submitted in the Examiner's Answer mailed Dec. 23, 2008, and simply reproduced in the Supplemental Examiner's Answer mailed May 14, 2009, Appellants refer to the arguments made in the Reply Brief filed Feb. 19, 2009 and Appeal Brief filed Sept. 22, 2008, and hereby incorporate the same by reference.

In the new section entitled "Response to the Reply Brief of 19 February 2009", the Examiner has listed four reasons (denoted by Sections A-D) why the Appellants' arguments made in the Reply Brief filed Feb. 19, 2009 were not found persuasive. Accordingly, the following reply will address each of the four Examiner responses found in the new section entitled "Response to the Reply Brief of 19 February 2009".

Response to reason A:

The Examiner states in Section A that the arguments presented on pages 2-3 of the Reply Brief filed Feb. 19, 2009 were considered in full in the Examiner's Answer mailed Dec. 23, 2008. Appellants respectfully assert that the arguments made in the Examiner's Answer mailed Dec. 23, 2008 were insufficient to show the propriety of the rejection, and respectfully assert that the rejection is improper for the reasons set forth in the Appeal Brief filed Sept. 22, 2008 and the Reply Brief filed Feb. 19, 2009.

Response to reason B:

The Examiner argues in Section B that the specification yields no limiting definition of functional groups. However, the term "functional groups" is well known to those having any background in chemistry. Accordingly, the term "functional group" as claimed is a term known in the art and needs no special definition. Moreover, the Examiner is requested to consider the following quote from MPEP 2164.01:

> A patent need not teach, and preferably omits, what is well known in the art. *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991); (emphasis added)

Thus, the claims having the functional group limitation require a functional group of the type known in the art. However, the Examiner has still not been able to show any piece of art that discloses the claimed invention and actually has a functional group.

Appellants also reiterate the following arguments, made in the Reply Brief filed Feb. 19, 2009

The Examiner first argues on p. 15 of the Examiner's Answer mailed Dec. 23, 2008 (hereinafter "Examiner's Answer") that Branton specifically teaches the crosslinking of the polymerase to the aperture forms a protein solid-state complex, and thus Branton indicates that DNA polymerase is a protein. Because Branton does not overtly disclose any functional groups, to meet this limitation, the Answer again goes on to assert that polymerases are proteins, which comprise chemical functional groups as evidenced by Stryer. Thus, asserts the Examiner, on p. 17 of the Examiner's Answer, DNA polymerase I inherently comprises functional groups because DNA polymerase I is unequivocally a polypeptide made of amino acids having side chains comprising functional groups.

Appellants again respectfully challenge this assertion. Appellants hereby incorporate by reference the arguments made in the Appeal Brief.

In addition, Appellants again argue that there has been no showing that DNA polymerase I includes functional groups. The Examiner's logic is that DNA polymerase I is a polypeptide made of amino acids having side chains comprising functional groups. However, referring to p. 14 of Stryer, several of Stryer's amino acids do not contain functional groups even in their amino acid state. See, e.g., Stryer Fig. 2-8, glycine, alanine. There has been no showing that DNA polymerase I is not based on one of these amino acids. Thus, the rejection is not properly supported.

Moreover, as asserted by Appellants in the Appeal Brief, the rejection improperly relies on a long chain of possibilities. Again, the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). Rather, to establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted, emphasis added). In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent

characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

Appellants again respectfully assert that the Examiner's assertion of inherency improperly relies on possibilities and probabilities, in violation of *In re Robertson, supra.* First, the Examiner has not shown that all amino acids have functional groups. In fact, it has been shown above that not all amino acids have functional groups. Thus we have a first possibility, that the polymerase relied upon is made up of amino acids that do not have functional groups. Again, no showing has been made of which amino acids are bases for DNA polymerase I.

Then consider that proteins are *reaction products* of amino acids. In other words, the base amino acid, which may or may not have a functional group, is then reacted with something to form a protein. Does a functional group of the amino acid retain its functionality, if it even has one? In other words, is the functional group still a functional group, or, now that the amino acid has reacted, is the functional group merely a nonfunctional branch of the protein, or even coupled to the other reactant? Possibly. From the evidence of record, we do not know. As should now be apparent, the logic of the rejection relies on too many levels of possibilities to support the Examiner's assertion of inherency. Again, "[i]nherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Robertson, supra.*

Moreover, Stryer does indicate that DNA polymerase 1 is an enzyme, but it is known that not all enzymes are proteins. Therefore, the rejection relies on the *possibility* that Branton's polymerase is not only the same as that in Stryer, *and also* that Stryer's DNA polymerase is a protein, *and yet further* that the protein is formed of amino acids that might have functional groups, *and even further that*, after all the processing necessary to convert the amino acids to the DNA polymerase, what might have been functional groups (if present) in the starting material are still functional groups rather than nonfunctional. As can be seen, the logic of the rejection relies on too many levels of possibilities to support the Examiner's assertion of inherency. Again, the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert, supra.* Rather, inherency "may not be established by probabilities or possibilities. The mere fact that a

certain thing may result from a given set of circumstances is not sufficient." *In re Robertson, supra.*

Nor can we simply take the Examiner's word for it. Again, to establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.' *In re Robertson, supra.*

Additionally, the Examiner asserts on p. 17 of the Examiner's Answer that the peptide bond is an amide bond, and an amide is a chemical functional group. This assertion relies on official notice, as no evidence has been presented to show that the peptide bond in DNA polymerase I is functional. However, official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known. As noted by the court in *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970), the notice of facts beyond the record which may be taken by the examiner must be "capable of such instant and unquestionable demonstration as to defy dispute" (citing *In re Knapp Monarch Co.*, 296 F.2d 230, 132 USPQ 6 (CCPA 1961)). It is never appropriate to rely solely on "common knowledge" in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based. *Zurko*, 258 F.3d at 1385, 59 USPQ2d at 1697. Appellants respectfully challenge the taking of official notice, and respectfully assert that it is not well-known, or common knowledge in the art that is capable of instant and unquestionable demonstration as being well-known, that the amide bond in DNA polymerase I is functional. Accordingly, absent some evidence on the record, the Examiner's assertion is improper.

The Examiner also argues that Stryer teaches on p. 13-14 that the "[t]wenty kinds of side chains" found in the amino acids control the "remarkable range of functions mediated by proteins results from the diversity and versatility of these twenty kinds of building blocks." Appellants note that the functions are noted in Stryer to be of the proteins, not any groups attached thereto, i.e., Stryer refers to functional protein, but not a protein having a functional group. Moreover, the functions that the proteins perform appear to be biological functions, such as controlling how a person is constructed, rather than relating to a chemical functional group.

Regardless, the rejection relies on an attempt to show a polymerase having functional groups. Thus, whether Stryer's proteins even have functional groups is irrelevant.

Appellants also note that the Examiner has failed to address the objection to the taking of Official Notice, as set forth in the Reply Brief filed Feb. 19, 2009.

Response to reason C:

The Examiner states in Section A that the arguments presented on pages 4-9 of the Reply Brief filed Feb. 19, 2009 were considered in full in the Examiner's Answer mailed Dec. 23, 2008. Appellants respectfully assert that the arguments made in the Examiner's Answer mailed Dec. 23, 2008 were insufficient to show the propriety of the rejection, and respectfully assert that the rejection is improper for the reasons set forth in the Appeal Brief filed Sept. 22, 2008 and the Reply Brief filed Feb. 19, 2009.

Response to reason D:

The Examiner states in Section A that the arguments presented on pages 9-13 of the Reply Brief filed Feb. 19, 2009 were considered in full in the Examiner's Answer mailed Dec. 23, 2008. Appellants respectfully assert that the arguments made in the Examiner's Answer mailed Dec. 23, 2008 were insufficient to show the propriety of the rejection, and respectfully assert that the rejection is improper for the reasons set forth in the Appeal Brief filed Sept. 22, 2008 and the Reply Brief filed Feb. 19, 2009.

In view of the remarks set forth hereinabove, all of the independent claims are deemed allowable, along with any claims depending therefrom.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 971-2573. For payment of any additional fees due in connection with the filing of this paper, the Commissioner is authorized to charge such fees to Deposit Account No. 50-1351 (Order No. LLNLP010).

Respectfully submitted,

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